Methodology Issues in Enterprise System Implementations

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INTRODUCTION

Enterprise Systems (ES), also known as Enterprise Resources Planning (ERP), are still challenged by managerial problems in European implementation practice to reduce the enormous complexity. Literature after Y2K doesn't support solutions for this practical statement directly. Second, methodology plays a dominant role and is closely related with managerial aspects of implementation projects. It's remarkable that management and methodology are mostly outsourced disciplines in ES implementations. There is no new insight knowledge about the methodology gained with research in depth. The main issue here is that we have no complete picture of all activities. Focus of this study is research in depth for a suitable methodology for ES implementations. The chosen research strategy is based on the "structured case" approach by Carroll and Swatman (2000), using the interpretative paradigm as a possible option in building a new theory. This paper represents the first findings as "methodology issues".
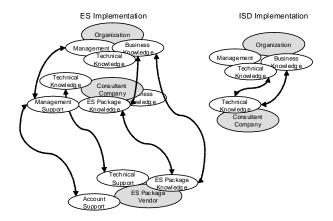
ENTERPRISE SYSTEMS AS A DIFFERENT KIND OF SOFTWARE

ES is widely cited as a new phenomenon in information systems. Nevertheless, it is not clearly qualified as a different type of software. In contrast, ISD has a rich tradition and it is accepted that ISD is an applied field in the academic world. A good academic distinction between ES and ISD is necessary to underline the different approach of ES. We will now discuss four differences between ISD and ES to motivate further research.

The *nature* for ISD development is based on functional requirements and in contrast, ES is design of system functionalities with pre-written software from a package vendor based on commercial requirements.

Figure 1 illustrates the different *actors* involved in an ES implementation between ES and ISD software with a focus on the design phase. People knowledge (with proper skills) is not similar for ISD implemen-

Figure 1. Involved design actors ES versus ISD implementation

tations, especially for the scope of knowledge. This because team members cross borders of several disciplines (Boudreau et al. 1999). Normally, users join implementation teams because they have excellent business knowledge. This so-called "user participation" is widely cited as a success factor in ISD and ES implementations. The user has, in this case, different meanings. In ISD, we have the "primary user" who use the system output. In ES, *power users* takes over this role as internal consultants among the users (Baskerville et al. 2000). The user stands, academically and practically, in another position, dimension and coherence.

Outsourcing in ES is a necessary strategy because there is not enough knowledge available in the organization ("Resource-based Theory"). Hired knowledge for design and project management support in this strategy is the acceptance of a project management approach and methodology from the hired company. That means not only the acceptation of knowledge but also the power of knowledge.
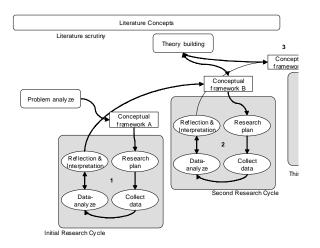
Lastly, there is a difference in meaning of the term "*complexity*". This is hard to define in an explicit way. In simple terms, complexity deals with quantity of elements, the relationship between these elements and the possible uncertainty of these relationships. There are motivations that ES implementation projects are more complex then other comparable ISD projects because ERP packages cross organizational boundaries (Boudreau et al. 1999), increasing external actors and increasing package functionalities (Hillegersberg et al. 2000).

LITERATURE REVIEW REGARDING ENTERPRISE SYSTEMS RESEARCH

Esteves and Pastor (2001a) cite in their bibliography that articles about ES appear in journals and conference papers from 1996 onwards. This research was done in that period to solve Y2K problems. A review of journals and conference papers dating up to 2005 regarding topics about ES research gives the following points of concern as relevant for the study:

a.) No new material is found after Y2K about implementation failures as research topic. But there are indications for managerial problems (Nandhakumar et al. 2003). This indication is in line with European implementation problems in practice to reduce the enormous complexity.

Publications to solve ES failures lean towards a more soft approach. Soft approaches are solutions with a focus on organization transition, organizational change (Boudreau et al. 1999) and social enablers. This means there is discussion about "hard" and "soft" approaches. The trend towards a more soft approach is in contrast with implementation problems about legacy systems, or, in other words, ignoring the hard problems (Holland et al. 1999b).

b.) There is also a gap with studies in the area of Business Processes Design with a quality chosen research methodology (in depth case studies) about "why and who". Studies resulting in "Critical Success Factors" are solutions for solving the implantation problems but are answers in about "what". The definition of success (in short) is the best outcome that could possibly be achieved (Markus et al. 2000).

Figure 2. "Structured Case" research approach (Carroll et al. 2000)

SUMMARY OF FINDINGS

In the first section, we identified four major differences between ES and ISD. Together with the review in the second section, it was the start for the "Initial Conceptual Framework" as mentioned in research strategy. The "Initial Research Cycle" supplies the following findings:

a.) The different nature of ES creates another methodology scope. IS methodology addresses major development problems. In ES, we have more, and include five implementation phases that must be supported by the methodology: Selection & Acquisition, Preparation, Design & Configuration, Transition and Go-live.

b.) Outsourcing of implementation activities start in the Selection & Acquisition phase. Acquiring the necessary knowledge is the driving factor for outsourcing. However, if there is more "Organizational ignorance" in the organization about the implementation of how to recognize project outcomes, then this will lead to more outsourcing. Methodology is, in that situation, an unknown issue. There is some relation for more implementation success with SAP and a hard contractual choice (no organizational ignorance) with the contractor for the ASAP method. Other software vendors are under investigation.

c.) As a consequence of "Organizational ignorance", the implementation starts without any methodology or commercial methodology. The implementation project must have changes made to the methodology during the design & configuration phase. A scenario approach of the methodology can be a solution to solve this problem. Second, Organizational ignorance is closely related with managerial implementation problems in all phases.

d.) Business Process Redesign (BPR) means fundamentally rethinking and radically redesigning business processes to achieve major improvements or benefits. This statement is widely cited in the literature as enabler in ERP implementations. In practice, we have standard software with standard package functionalities gained from internal and external consultants instead of radically redesigning processes. Communication with the organization (outside the project) during the design phase leads to a further redesigning of existing functionalities. The methodology must support several rules on which way we want to design (hard and soft aspects).

c.) Thinking from a traditional ISD definition angle, methodologies are normative in the sense that they organize sets of behavioral and technical rules into a coherent approach which prescribe how to address major development problems (Hirschheim et al. 1995). In this case, there is no material available that has frameworks and models that result in a suitable methodology to realize implementations of ES software in a successful way.

d.) ES literature does not clearly substantiate that knowledge gained from ISD research can be applicable to ES research.
Methodology is discussed from a ISD standpoint (Hedman 2004) rather than an analysis of implementations with a critical attitude to gain new ideas (Kawalek et al. 2002).
With user participation, we see in ES other primary users. "Power users" take over this role because power users are self-starting leaders with a quasi-formal role as internal consultants. Primary or system users need a different, wider range of talents and skills to participate in project networks. This changed view is not found in ES literature (Bagchi et al. 2003; Wu et al. 2002).

RESEARCH METHODOLOGY

This study tries to find an answer to "how" we can achieve a better implementation instead of "what" the problem factors are. Two fundamental theoretical theses, the philosophical perspective (Klein et al. 1999) and the process approach, lead to a choice for research methodology with the possibility of building a theory. A possible solution is the grounded theory. This approach has some disadvantages for this study. Grounded theory uses causality relations instead of understanding "what is happening". Secondly, coding does not play a central role but is an important tool to store and retrieve information for interpretation. These disadvantages lead to the methodology framework of Carroll and Swatman (2000). They have developed a "structured case" research methodology for theory building based on an interpretative paradigm and literature scrutiny.

The "structured case", addresses the research field that fits the relatively broad research question: *Which required methodology approach is needed for a better control of ES implementation?*

The main research area used to find an answer to this question is a large government agency during an extensive ES implementation. Research is carried out while working as a member of the project team to support the implementation process. The research period is about 2 years and started in 2005. Other worldwide implementation projects are used for reflective analysis of data and to validate relevant findings. Data collections are created by field notes, personal observations, structured and unstructured interviews (Patton 1990).

CONCLUSIONS

Summarizing the literature review and the findings, we have the first requirements for a proposed methodology: An overall approach with the five phases in time is the basic scope for the methodology with hard (IT problems with technical aspects) and soft approaches addressed in all phases. Secondly, a handsome solution must be available to solve "Organizational Ignorance". Thirdly, flexibility is necessary to use the methodology, not only at the start of the implementation project but also offer the possibility to "jump in" at a later moment. Other challenges to be addressed during this research in depth are: finding tools and techniques to reduce the complex problem situations and practical usefulness of the methodology.

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